



MOTOROLA

Order this document by MC7800/D

Three-Terminal Positive Voltage Regulators

These voltage regulators are monolithic integrated circuits designed as fixed-voltage regulators for a wide variety of applications including local, on-card regulation. These regulators employ internal current limiting, thermal shutdown, and safe-area compensation. With adequate heatsinking they can deliver output currents in excess of 1.0 A. Although designed primarily as a fixed voltage regulator, these devices can be used with external components to obtain adjustable voltages and currents.

- Output Current in Excess of 1.0 A
- No External Components Required
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe-Area Compensation
- Output Voltage Offered in 2% and 4% Tolerance
- Available in Surface Mount D²PAK and Standard 3-Lead Transistor Packages
- Previous Commercial Temperature Range has been Extended to a Junction Temperature Range of -40°C to +125°C

DEVICE TYPE/NOMINAL OUTPUT VOLTAGE

MC7805AC	5.0 V	MC7812C	12 V
LM340AT-5		LM340T-12	
MC7805C		MC7815AC	15 V
LM340T-5	6.0 V	LM340AT-15	
MC7806AC		MC7815C	
MC7806C		LM340T-15	18 V
MC7808AC	8.0 V	MC7818AC	
MC7808C		MC7818C	
MC7809C	9.0 V	MC7824AC	24 V
MC7812AC	12 V	MC7824C	
LM340AT-12			

ORDERING INFORMATION

Device	Output Voltage Tolerance	Operating Temperature Range	Package
MC78XXACT	2%	$T_J = -40^{\circ} \text{ to } +125^{\circ}\text{C}$	Insertion Mount
LM340AT-XX			
MC78XXACD2T			Surface Mount
MC78XXCT	4%		Insertion Mount
LM340T-XX			
MC78XXCD2T			Surface Mount

XX indicates nominal voltage.

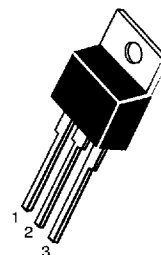
MC7800, MC7800A, LM340, LM340A Series

THREE-TERMINAL POSITIVE FIXED VOLTAGE REGULATORS

SEMICONDUCTOR TECHNICAL DATA

T SUFFIX
PLASTIC PACKAGE
CASE 221A

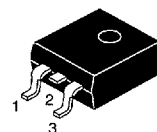
Heatsink surface
connected to Pin 2.



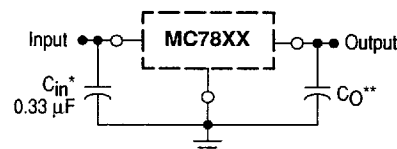
Pin 1. Input
2. Ground
3. Output

D2T SUFFIX
PLASTIC PACKAGE
CASE 936
(D²PAK)

Heatsink surface (shown as terminal 4 in
case outline drawing) is connected to Pin 2.



STANDARD APPLICATION



A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0 V above the output voltage even during the low point on the input ripple voltage.

XX, These two digits of the type number indicate nominal voltage.

* C_{in} is required if regulator is located an appreciable distance from power supply filter.

** C_O is not needed for stability; however, it does improve transient response. Values of less than 0.1 μF could cause instability.

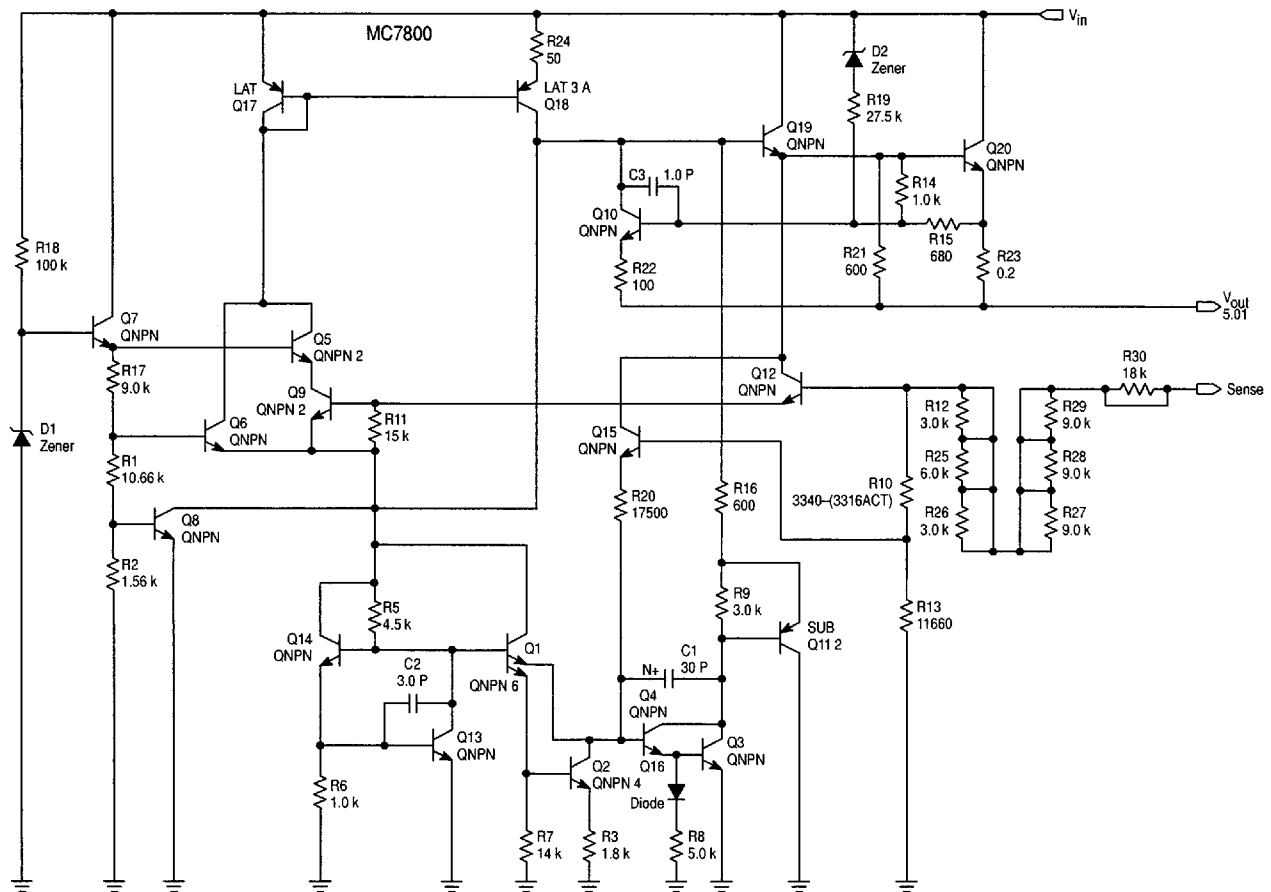
MC7800, MC7800A, LM340, LM340A Series

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted.)

Rating	Symbol	Value	Unit
Input Voltage (5.0 – 18 V) (24 V)	V_I	35 40	Vdc
Power Dissipation Case 221A $T_A = 25^\circ\text{C}$ Thermal Resistance, Junction-to-Ambient Thermal Resistance, Junction-to-Case Case 936 (D ² PAK) $T_A = 25^\circ\text{C}$ Thermal Resistance, Junction-to-Ambient Thermal Resistance, Junction-to-Case	P_D $R_{\theta JA}$ $R_{\theta JC}$ P_D $R_{\theta JA}$ $R_{\theta JA}$	Internally Limited 65 5.0 Internally Limited See Figure 13 5.0	W $^\circ\text{C/W}$ $^\circ\text{C/W}$ W $^\circ\text{C/W}$ $^\circ\text{C/W}$
Storage Junction Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature	T_J	+150	$^\circ\text{C}$

NOTE: ESD data available upon request.

Representative Schematic Diagram



This device contains 22 active transistors.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS ($V_{in} = 10\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7805C/LM340T-5			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	4.8	5.0	5.2	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) 7.0 Vdc $\leq V_{in} \leq 20\text{ Vdc}$ 8.0 Vdc $\leq V_{in} \leq 20\text{ Vdc}$	V_O	4.75 —	5.0 —	5.25 —	Vdc
Line Regulation (Note 2) 7.5 Vdc $\leq V_{in} \leq 20\text{ Vdc}$, $I_O = 1.0\text{ A}$ 8.0 Vdc $\leq V_{in} \leq 12\text{ Vdc}$	Regline	— —	0.5 0.8	20 10	mV
Load Regulation (Note 2) 5.0 mA $\leq I_O \leq 1.0\text{ A}$ 5.0 mA $\leq I_O \leq 1.5\text{ A}$ ($T_A = 25^\circ\text{C}$)	Regload	— —	1.3 1.3	25 25	mV
Quiescent Current	I_B	—	3.2	6.5	mA
Quiescent Current Change 7.0 Vdc $\leq V_{in} \leq 25\text{ Vdc}$ 5.0 mA $\leq I_O \leq 1.0\text{ A}$ ($T_A = 25^\circ\text{C}$)	ΔI_B	— —	0.3 0.08	1.0 0.8	mA
Ripple Rejection 8.0 Vdc $\leq V_{in} \leq 18\text{ Vdc}$, $f = 120\text{ Hz}$	RR	62	83	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) 10 Hz $\leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0\text{ kHz}$	r_O	—	0.9	—	m Ω
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.6	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	-0.3	—	mV/ $^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 10\text{ V}$, $I_O = 1.0\text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7805AC/LM340AT-5			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	4.9	5.0	5.1	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) 7.5 Vdc $\leq V_{in} \leq 20\text{ Vdc}$	V_O	4.8	5.0	5.2	Vdc
Line Regulation (Note 2) 7.5 Vdc $\leq V_{in} \leq 25\text{ Vdc}$, $I_O = 500\text{ mA}$ 8.0 Vdc $\leq V_{in} \leq 12\text{ Vdc}$, $I_O = 1.0\text{ A}$ 8.0 Vdc $\leq V_{in} \leq 12\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$ 7.3 Vdc $\leq V_{in} \leq 20\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$	Regline	— — — —	0.5 0.8 1.3 4.5	10 12 4.0 10	mV
Load Regulation (Note 2) 5.0 mA $\leq I_O \leq 1.5\text{ A}$, $T_J = 25^\circ\text{C}$ 5.0 mA $\leq I_O \leq 1.0\text{ A}$ 250 mA $\leq I_O \leq 750\text{ mA}$	Regload	— — —	1.3 0.8 0.53	25 25 15	mV
Quiescent Current	I_B	—	3.2	6.0	mA
Quiescent Current Change 8.0 Vdc $\leq V_{in} \leq 25\text{ Vdc}$, $I_O = 500\text{ mA}$ 7.5 Vdc $\leq V_{in} \leq 20\text{ Vdc}$, $T_J = 25^\circ\text{C}$ 5.0 mA $\leq I_O \leq 1.0\text{ A}$	ΔI_B	— — —	0.3 — 0.08	0.8 0.8 0.5	mA
Ripple Rejection 8.0 Vdc $\leq V_{in} \leq 18\text{ Vdc}$, $f = 120\text{ Hz}$, $I_O = 500\text{ mA}$	RR	68	83	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS (continued) ($V_{in} = 10\text{ V}$, $I_O = 1.0\text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7805AC/LM340AT-5			Unit
		Min	Typ	Max	
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	–	10	–	$\mu\text{V}/V_O$
Output Resistance ($f = 1.0\text{ kHz}$)	r_O	–	0.9	–	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	–	0.2	–	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	–	2.2	–	A
Average Temperature Coefficient of Output Voltage	TCV_O	–	–0.3	–	$\text{mV}/^\circ\text{C}$

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX
 2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

ELECTRICAL CHARACTERISTICS ($V_{in} = 11\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7806C			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	5.75	6.0	6.25	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $8.0\text{ Vdc} \leq V_{in} \leq 21\text{ Vdc}$ $9.0\text{ Vdc} \leq V_{in} \leq 21\text{ Vdc}$	V_O	5.7 –	6.0 –	6.3 –	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $8.0\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$ $9.0\text{ Vdc} \leq V_{in} \leq 13\text{ Vdc}$	Regline	– –	0.5 0.8	24 12	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$	Regload	–	1.3	30	mV
Quiescent Current ($T_J = 25^\circ\text{C}$)	I_B	–	3.3	8.0	mA
Quiescent Current Change $8.0\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	– –	0.3 0.08	1.3 0.5	mA
Ripple Rejection $9.0\text{ Vdc} \leq V_{in} \leq 19\text{ Vdc}$, $f = 120\text{ Hz}$	RR	58	65	–	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	–	2.0	–	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	–	10	–	$\mu\text{V}/V_O$
Output Resistance $f = 1.0\text{ kHz}$	r_O	–	0.9	–	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	–	0.2	–	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	–	2.2	–	A
Average Temperature Coefficient of Output Voltage	TCV_O	–	–0.3	–	$\text{mV}/^\circ\text{C}$

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C
 2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS ($V_{in} = 11\text{ V}$, $I_O = 1.0\text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7806AC			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	5.88	6.0	6.12	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $8.6\text{ Vdc} \leq V_{in} \leq 21\text{ Vdc}$	V_O	5.76	6.0	6.24	Vdc
Line Regulation (Note 2) $8.6\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$, $I_O = 500\text{ mA}$ $9.0\text{ Vdc} \leq V_{in} \leq 13\text{ Vdc}$, $I_O = 1.0\text{ A}$	Regline	— —	5.0 1.4	12 15	mV
Load Regulation (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$ $250\text{ mA} \leq I_O \leq 750\text{ mA}$	Regload	— — —	1.3 0.9 0.2	25 25 15	mV
Quiescent Current	I_B	—	3.3	6.0	mA
Quiescent Current Change $9.0\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$, $I_O = 500\text{ mA}$ $9.0\text{ Vdc} \leq V_{in} \leq 21\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	— — —	— — —	0.8 0.8 0.5	mA
Ripple Rejection $9.0\text{ Vdc} \leq V_{in} \leq 19\text{ Vdc}$, $f = 120\text{ Hz}$, $I_O = 500\text{ mA}$	RR	58	65	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance ($f = 1.0\text{ kHz}$)	r_O	—	0.9	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−0.3	—	$\text{mV}/^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 14\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7808C			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	7.7	8.0	8.3	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $10.5\text{ Vdc} \leq V_{in} \leq 23\text{ Vdc}$	V_O	7.6	8.0	8.4	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$, (Note 2) $10.5\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$ $11\text{ Vdc} \leq V_{in} \leq 17\text{ Vdc}$	Regline	— —	6.0 1.7	32 16	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$	Regload	—	1.4	35	mV
Quiescent Current	I_B	—	3.3	8.0	mA
Quiescent Current Change $10.5\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	— —	— —	1.0 0.5	mA
Ripple Rejection $11.5\text{ Vdc} \leq V_{in} \leq 18\text{ Vdc}$, $f = 120\text{ Hz}$	RR	56	62	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS (continued) ($V_{in} = 14\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7808C			Unit
		Min	Typ	Max	
Output Resistance $f = 1.0\text{ kHz}$	r_O	—	0.9	—	$m\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−0.4	—	$mV/^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 14\text{ V}$, $I_O = 1.0\text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7808AC			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	7.84	8.0	8.16	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $10.6\text{ Vdc} \leq V_{in} \leq 23\text{ Vdc}$	V_O	7.7	8.0	8.3	Vdc
Line Regulation (Note 2) $10.6\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$, $I_O = 500\text{ mA}$ $11\text{ Vdc} \leq V_{in} \leq 17\text{ Vdc}$, $I_O = 1.0\text{ A}$ $10.4\text{ Vdc} \leq V_{in} \leq 23\text{ Vdc}$, $T_J = 25^\circ\text{C}$	Reg_{line}	— — —	6.0 1.7 5.0	15 18 15	mV
Load Regulation (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$ $250\text{ mA} \leq I_O \leq 750\text{ mA}$	Reg_{load}	— — —	1.4 1.0 0.22	25 25 15	mV
Quiescent Current	I_B	—	3.3	6.0	mA
Quiescent Current Change $11\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$, $I_O = 500\text{ mA}$ $10.6\text{ Vdc} \leq V_{in} \leq 23\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	— — —	— — —	0.8 0.8 0.5	mA
Ripple Rejection $11.5\text{ Vdc} \leq V_{in} \leq 21.5\text{ Vdc}$, $f = 120\text{ Hz}$, $I_O = 500\text{ mA}$	RR	56	62	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0\text{ kHz}$	r_O	—	0.9	—	$m\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−0.4	—	$mV/^\circ\text{C}$

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS ($V_{in} = 15\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7809CT			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	8.65	9.0	9.35	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$ $11.5\text{ Vdc} \leq V_{in} \leq 24\text{ Vdc}$)	V_O	8.55	9.0	9.45	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $11\text{ Vdc} \leq V_{in} \leq 26\text{ Vdc}$ $11.5\text{ Vdc} \leq V_{in} \leq 17\text{ Vdc}$	Regline	—	6.2 1.8	32 16	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$	Regload	—	1.5	35	mV
Quiescent Current	I_B	—	3.4	8.0	mA
Quiescent Current Change $11.5\text{ Vdc} \leq V_{in} \leq 26\text{ Vdc}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	—	—	1.0 0.5	mA
Ripple Rejection $11.5\text{ Vdc} \leq V_{in} \leq 21.5\text{ Vdc}$, $f = 120\text{ Hz}$	RR	56	61	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0\text{ kHz}$	r_O	—	1.0	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−0.5	—	$\text{mV}/^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 19\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7812C/LM340T-12			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	11.5	12	12.5	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$ $14.5\text{ Vdc} \leq V_{in} \leq 27\text{ Vdc}$)	V_O	11.4	12	12.6	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $14.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$ $16\text{ Vdc} \leq V_{in} \leq 22\text{ Vdc}$ $14.8\text{ Vdc} \leq V_{in} \leq 27\text{ Vdc}$, $I_O = 1.0\text{ A}$	Regline	—	3.8 0.3 —	24 24 48	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$	Regload	—	8.1	60	mV
Quiescent Current	I_B	—	3.4	6.5	mA
Quiescent Current Change $14.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$ $15\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	—	—	0.7 0.8 0.5	mA
Ripple Rejection $15\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$, $f = 120\text{ Hz}$	RR	55	60	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS (continued) ($V_{in} = 19\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7812C/LM340T-12			Unit
		Min	Typ	Max	
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0\text{ kHz}$	r_O	—	1.1	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−0.8	—	$\text{mV}/^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 19\text{ V}$, $I_O = 1.0\text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7812AC/LM340AT-12			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	11.75	12	12.25	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $14.8\text{ Vdc} \leq V_{in} \leq 27\text{ Vdc}$	V_O	11.5	12	12.5	Vdc
Line Regulation (Note 2) $14.8\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 500\text{ mA}$ $16\text{ Vdc} \leq V_{in} \leq 22\text{ Vdc}$, $I_O = 1.0\text{ A}$ $14.5\text{ Vdc} \leq V_{in} \leq 27\text{ Vdc}$, $T_J = 25^\circ\text{C}$	Regline	— — —	3.8 2.2 6.0	18 20 120	mV
Load Regulation (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	Regload	— —	— —	25 25	mV
Quiescent Current	I_B	—	3.4	6.0	mA
Quiescent Current Change $15\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 500\text{ mA}$ $14.8\text{ Vdc} \leq V_{in} \leq 27\text{ Vdc}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $T_J = 25^\circ\text{C}$	ΔI_B	— — —	— — —	0.8 0.8 0.5	mA
Ripple Rejection $15\text{ Vdc} \leq V_{in} \leq 25\text{ Vdc}$, $f = 120\text{ Hz}$, $I_O = 500\text{ mA}$	RR	55	60	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance ($f = 1.0\text{ kHz}$)	r_O	—	1.1	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−0.8	—	$\text{mV}/^\circ\text{C}$

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS ($V_{in} = 23\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7815C/LM340T-15			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	14.4	15	15.6	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $17.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$	V_O	14.25	15	15.75	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $17.9\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$ $20\text{ Vdc} \leq V_{in} \leq 26\text{ Vdc}$	Regline	— —	8.5 3.0	30 28	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$	Regload	—	1.8	55	mV
Quiescent Current	I_B	—	3.5	6.5	mA
Quiescent Current Change $17.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$ $17.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	— — —	— — —	0.8 0.7 0.5	mA
Ripple Rejection $18.5\text{ Vdc} \leq V_{in} \leq 28.5\text{ Vdc}$, $f = 120\text{ Hz}$	RR	54	58	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0\text{ kHz}$	r_O	—	1.2	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−1.0	—	$\text{mV}/^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 23\text{ V}$, $I_O = 1.0\text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7815AC/LM340AT-15			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	14.7	15	15.3	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $17.9\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$	V_O	14.4	15	15.6	Vdc
Line Regulation (Note 2) $17.9\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 500\text{ mA}$ $20\text{ Vdc} \leq V_{in} \leq 26\text{ Vdc}$ $17.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$	Regline	— — —	8.5 3.0 7.0	20 22 20	mV
Load Regulation (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$ $250\text{ mA} \leq I_O \leq 750\text{ mA}$	Regload	— — —	1.8 1.5 1.2	25 25 15	mV
Quiescent Current	I_B	—	3.5	6.0	mA
Quiescent Current Change $17.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 500\text{ mA}$ $17.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	— — —	— — —	0.8 0.8 0.5	mA

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C, LM340AT-XX, LM340T-XX

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS (continued) ($V_{in} = 23 \text{ V}$, $I_O = 1.0 \text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7815AC/LM340AT-15			Unit
		Min	Typ	Max	
Ripple Rejection $18.5 \text{ Vdc} \leq V_{in} \leq 28.5 \text{ Vdc}$, $f = 120 \text{ Hz}$, $I_O = 500 \text{ mA}$	RR	60	80	—	dB
Dropout Voltage ($I_O = 1.0 \text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10 \text{ Hz} \leq f \leq 100 \text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0 \text{ kHz}$	r_O	—	1.2	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35 \text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	-1.0	—	$\text{mV}/^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 27 \text{ V}$, $I_O = 500 \text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7818C			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	17.3	18	18.7	Vdc
Output Voltage ($5.0 \text{ mA} \leq I_O \leq 1.0 \text{ A}$, $P_D \leq 15 \text{ W}$) $21 \text{ Vdc} \leq V_{in} \leq 33 \text{ Vdc}$	V_O	17.1	18	18.9	Vdc
Line Regulation, (Note 2) $21 \text{ Vdc} \leq V_{in} \leq 33 \text{ Vdc}$ $24 \text{ Vdc} \leq V_{in} \leq 30 \text{ Vdc}$	Regline	— —	9.5 3.2	50 25	mV
Load Regulation, (Note 2) $5.0 \text{ mA} \leq I_O \leq 1.5 \text{ A}$	Regload	—	2.0	55	mV
Quiescent Current	I_B	—	3.5	6.5	mA
Quiescent Current Change $21 \text{ Vdc} \leq V_{in} \leq 33 \text{ Vdc}$ $5.0 \text{ mA} \leq I_O \leq 1.0 \text{ A}$	ΔI_B	— —	— —	1.0 0.5	mA
Ripple Rejection $22 \text{ Vdc} \leq V_{in} \leq 33 \text{ Vdc}$, $f = 120 \text{ Hz}$	RR	53	57	—	dB
Dropout Voltage ($I_O = 1.0 \text{ A}$, $T_J = 25^\circ\text{C}$)	$V_{II} - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10 \text{ Hz} \leq f \leq 100 \text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0 \text{ kHz}$	r_O	—	1.3	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35 \text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	-1.5	—	$\text{mV}/^\circ\text{C}$

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS ($V_{in} = 27\text{ V}$, $I_O = 1.0\text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7818AC			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	17.64	18	18.36	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $21\text{ Vdc} \leq V_{in} \leq 33\text{ Vdc}$	V_O	17.3	18	18.7	Vdc
Line Regulation (Note 2) $21\text{ Vdc} \leq V_{in} \leq 33\text{ Vdc}$, $I_O = 500\text{ mA}$ $24\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 1.0\text{ A}$ $24\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$ $20.6\text{ Vdc} \leq V_{in} \leq 33\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$	Regline	— — — —	9.5 3.2 3.2 8.0	22 25 10.5 22	mV
Load Regulation (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$ $250\text{ mA} \leq I_O \leq 750\text{ mA}$	Regload	— — —	2.0 1.8 1.5	25 25 15	mV
Quiescent Current	I_B	—	3.5	6.0	mA
Quiescent Current Change $21\text{ Vdc} \leq V_{in} \leq 33\text{ Vdc}$, $I_O = 500\text{ mA}$ $21.5\text{ Vdc} \leq V_{in} \leq 30\text{ Vdc}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	— — —	— — —	0.8 0.8 0.5	mA
Ripple Rejection $22\text{ Vdc} \leq V_{in} \leq 32\text{ Vdc}$, $f = 120\text{ Hz}$, $I_O = 500\text{ mA}$	RR	53	57	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0\text{ kHz}$	r_O	—	1.3	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	—1.5	—	$\text{mV}/^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 33\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7824C			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	23	24	25	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $27\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$	V_O	22.8	24	25.2	Vdc
Line Regulation, (Note 2) $27\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$ $30\text{ Vdc} \leq V_{in} \leq 36\text{ Vdc}$	Regline	— —	2.7 2.7	60 48	mV
Load Regulation, (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$	Regload	—	4.4	65	mV
Quiescent Current	I_B	—	3.6	6.5	mA
Quiescent Current Change $27\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	— —	— —	1.0 0.5	mA

NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

ELECTRICAL CHARACTERISTICS (continued) ($V_{in} = 33\text{ V}$, $I_O = 500\text{ mA}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7824C			Unit
		Min	Typ	Max	
Ripple Rejection $28\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$, $f = 120\text{ Hz}$	RR	50	54	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance $f = 1.0\text{ kHz}$	r_O	—	1.4	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−2.0	—	$\text{mV}/^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{in} = 33\text{ V}$, $I_O = 1.0\text{ A}$, $T_J = T_{low}$ to T_{high} [Note 1], unless otherwise noted.)

Characteristic	Symbol	MC7824AC			Unit
		Min	Typ	Max	
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	23.5	24	24.5	Vdc
Output Voltage ($5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$, $P_D \leq 15\text{ W}$) $27.3\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$	V_O	23.2	24	25.8	Vdc
Line Regulation (Note 2) $27\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$, $I_O = 500\text{ mA}$ $30\text{ Vdc} \leq V_{in} \leq 36\text{ Vdc}$, $I_O = 1.0\text{ A}$ $30\text{ Vdc} \leq V_{in} \leq 36\text{ Vdc}$, $T_J = 25^\circ\text{C}$ $26.7\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$, $I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$	Regline	— — — —	11.5 3.8 3.8 10	25 28 12 25	mV
Load Regulation (Note 2) $5.0\text{ mA} \leq I_O \leq 1.5\text{ A}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$ $250\text{ mA} \leq I_O \leq 750\text{ mA}$	Regload	— — —	2.1 2.0 1.8	15 25 15	mV
Quiescent Current	I_B	—	3.6	6.0	mA
Quiescent Current Change $27.3\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$, $I_O = 500\text{ mA}$ $27\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$, $T_J = 25^\circ\text{C}$ $5.0\text{ mA} \leq I_O \leq 1.0\text{ A}$	ΔI_B	— — —	— — —	0.8 0.8 0.5	mA
Ripple Rejection $28\text{ Vdc} \leq V_{in} \leq 38\text{ Vdc}$, $f = 120\text{ Hz}$, $I_O = 500\text{ mA}$	RR	45	54	—	dB
Dropout Voltage ($I_O = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$)	$V_I - V_O$	—	2.0	—	Vdc
Output Noise Voltage ($T_A = 25^\circ\text{C}$) $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	—	10	—	$\mu\text{V}/V_O$
Output Resistance ($f = 1.0\text{ kHz}$)	r_O	—	1.4	—	$\text{m}\Omega$
Short Circuit Current Limit ($T_A = 25^\circ\text{C}$) $V_{in} = 35\text{ Vdc}$	I_{SC}	—	0.2	—	A
Peak Output Current ($T_J = 25^\circ\text{C}$)	I_{max}	—	2.2	—	A
Average Temperature Coefficient of Output Voltage	TCV_O	—	−2.0	—	$\text{mV}/^\circ\text{C}$

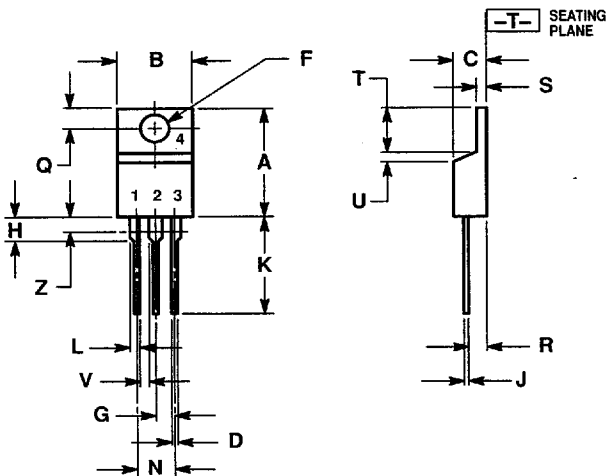
NOTES: 1. $T_{low} = -40^\circ\text{C}$ for MC78XXAC, C $T_{high} = +125^\circ\text{C}$ for MC78XXAC, C

2. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

MC7800, MC7800A, LM340, LM340A Series

OUTLINE DIMENSIONS

T SUFFIX PLASTIC PACKAGE CASE 221A-06 ISSUE Y

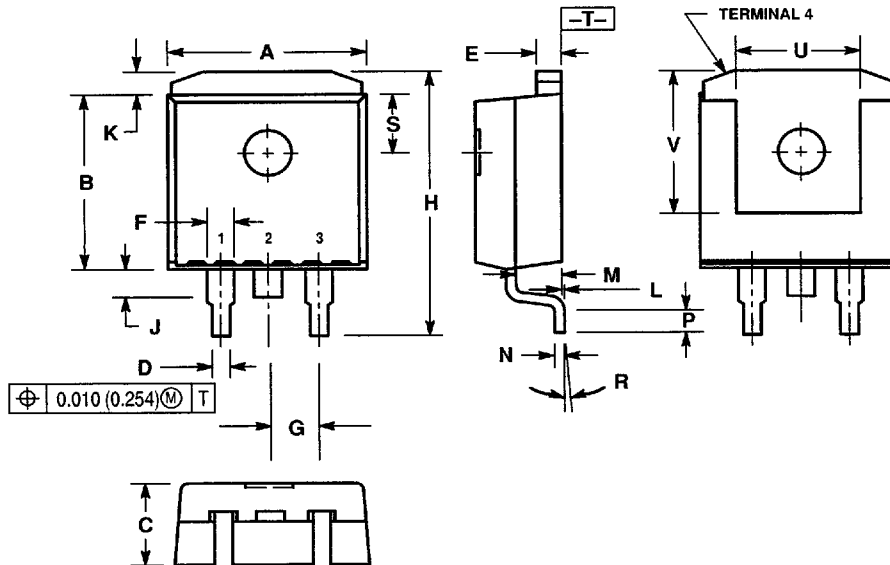


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIM Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	-	1.15	-
Z	-	0.080	-	2.04

D2T SUFFIX PLASTIC PACKAGE CASE 936-03 (D²PAK) ISSUE B



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. TAB CONTOUR OPTIONAL WITHIN DIMENSIONS A AND K.
4. DIMENSIONS U AND V ESTABLISH A MINIMUM MOUNTING SURFACE FOR TERMINAL 4.
5. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH OR GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.025 (0.635) MAXIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.386	0.403	9.804	10.236
B	0.356	0.368	9.042	9.347
C	0.170	0.180	4.318	4.572
D	0.026	0.036	0.660	0.914
E	0.045	0.055	1.143	1.397
F	0.051 REF	1.295 REF		
G	0.100 BSC	2.540 BSC		
H	0.539	0.579	13.691	14.707
J	0.125 MAX	3.175 MAX		
K	0.050 REF	1.270 REF		
L	0.000	0.010	0.000	0.254
M	0.088	0.102	2.235	2.591
N	0.018	0.026	0.457	0.660
P	0.058	0.078	1.473	1.981
R	5° REF	5° REF		
S	0.116 REF	2.946 REF		
U	0.200 MIN	5.080 MIN		
V	0.250 MIN	6.350 MIN		

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MC7800/D